

Review items

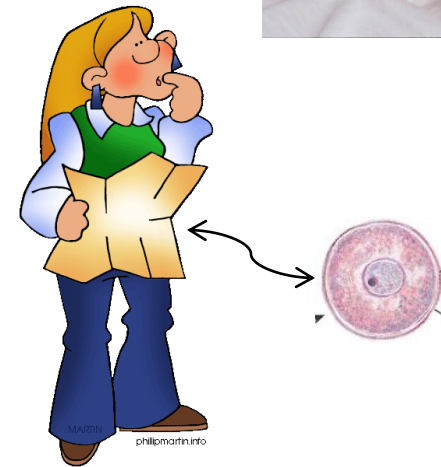
# Stem Cells

Cells that contain all of our genetic information –

**Not just in the umbilical cord**

complete directions to build a person (or frog or...).

- Bone marrow (to make blood)
- Testes (to make sperm)
- Embryo (first two weeks)
- Umbilical cord
- Various other areas in body



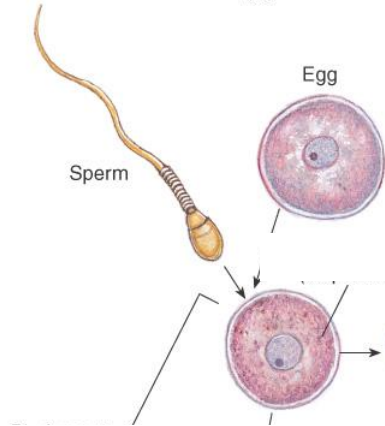
- Questions

- Are eggs and sperm stem cells?

- Another?

# What is a stem cell?

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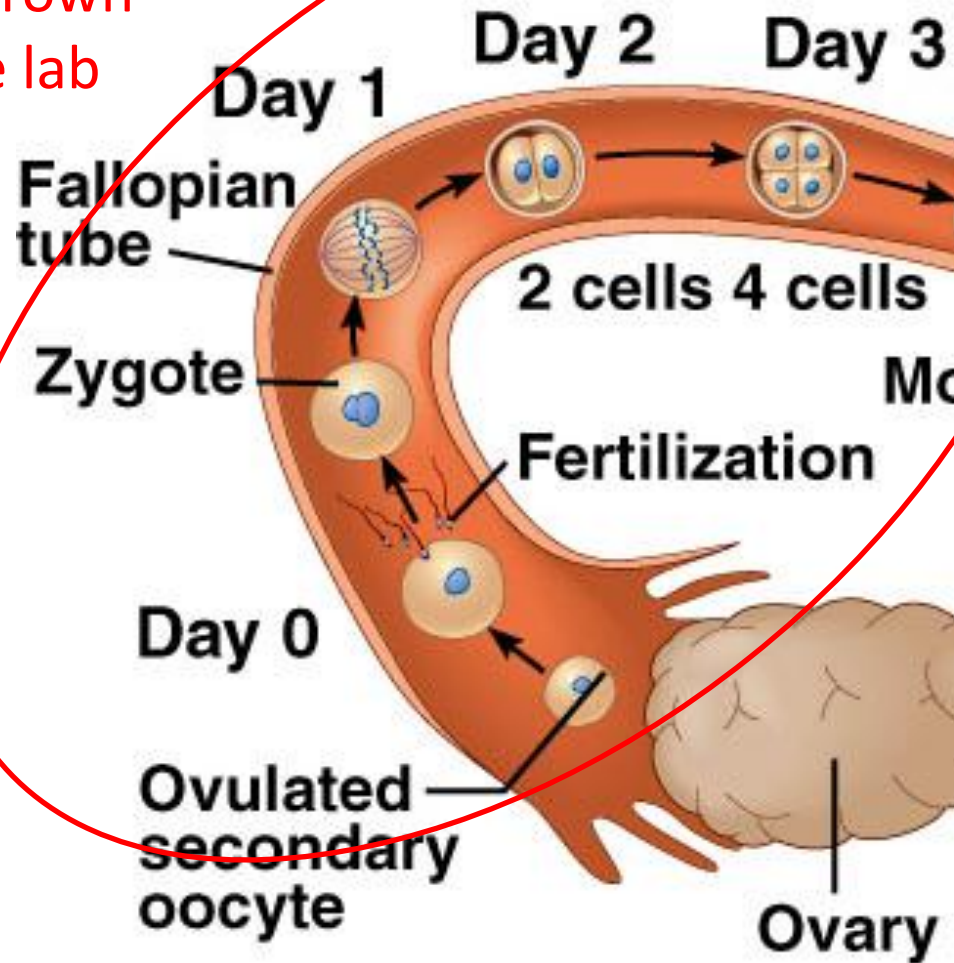
Differentiated

# **In Vitro Fertilization (IVF)**

1. Super-ovulation is induced in mother to be
2. Multiple eggs removed
3. Combined with sperm in the lab

# Early development

Fertilized  
and grown  
in the lab

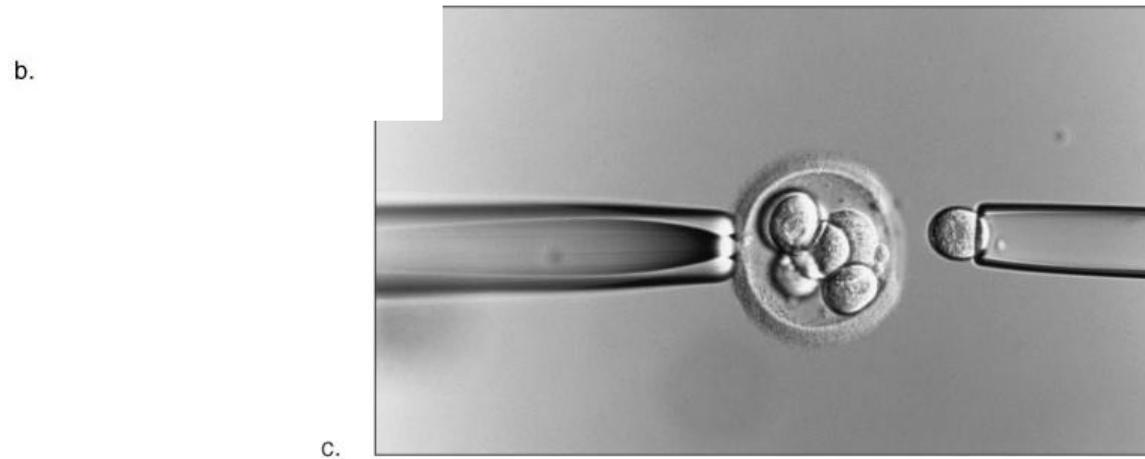
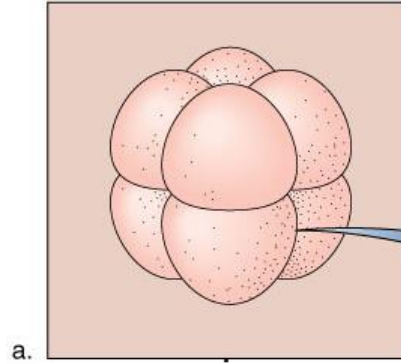


Drugs help lots of eggs  
mature  
Surgically remove ~30

# In Vitro Fertilization (IVF)

1. Super-ovulation is induced in mother to be
2. Multiple eggs removed
3. Combined with sperm
4. **Rate** the health of each embryo
5. Flash frozen while testing and waiting for mom

# Cell Removal





# Testing

- Now do all 23 chromosomes
- Missing pieces or too much information
- BUT – not every trait!!
- Certain diseases and gender

# In Vitro Fertilization (IVF)

1. Super-ovulation is induced in mother to be
2. Multiple eggs removed
3. Combined with sperm
4. **Rate** the health of each embryo
5. Flash frozen while testing and waiting for mom
6. Fertilized embryos/blastocysts are implanted in uterus
7. Extra embryos remain frozen

Brecken and Kaiya  
both had 8-1 = **7 cells while embryos.**  
Flash frozen and stored for several weeks. *2 others still frozen.*







# Sciences

- **Seismologists**
  - Young science: Plate tectonics 1960's
  - Geologic time is extremely hard to envision. Rocks move 1 inch per year. We have ~150 years of data on earthquakes.
  - Work in the field
  - Can only drill 10 miles into earth ~4000 miles deep
  - Use sound waves to study the earth.
  - Monitor earth's activity (including nuclear activity)

# Sciences

- **Biologists**

- Lots of work on classifying and understanding where and how different plants and animals lived.
- After Mendel a switch from studying types of organisms to understanding the chemical basis of life.
- Understanding life: “young science” DNA discovered in 1950’s
- Tremendous personal satisfaction helping humans
- Ethical concerns

# Sciences

- **Science 465** - Unit on musical instruments
  - Compared and contrasted individual instruments
  - Generalized the basics of *why they work*